

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MEHRAN ARBAB, RUSSELL C. CRISS and LARRY A. MILLER

Appeal No. 2001-1092
Application No. 09/169,490

ON BRIEF

Before WARREN, WALTZ, and TIMM, Administrative Patent Judges.
WALTZ, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the examiner's final rejection of claims 42 through 51, which are the only claims pending in this application.¹ We have jurisdiction pursuant to 35 U.S.C. § 134.

According to appellants, the invention is directed to sputter coating a film that has an atom arrangement conducive to deposition

¹Appellants' amendment subsequent to the final rejection, cancelling non-elected claims 52-55, was entered by the examiner (see the amendment dated May 12, 2000, Paper No. 10, entered as per the Advisory Action dated May 26, 2000, Paper No. 11).

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of a low resistance, metallic, reflective film on top thereof (Brief, page 2). A copy of illustrative independent claim 42 is attached as an Appendix to this decision.

The examiner relies upon the following references as evidence of obviousness:

Finley	4,898,790	Feb. 06, 1990
Miyazaki et al. (Miyazaki '864)	5,413,864	May 09, 1995
Miyazaki et al. (Miyazaki '969)	5,419,969	May 30, 1995

Claims 42-47 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Miyazaki '969 in view of Miyazaki '864 (Answer, page 3). Claims 48-51 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Miyazaki '969 in view of Miyazaki '864 further in view of Finley (Answer, page 6). We reverse all of the examiner's rejections on appeal essentially for the reasons stated in the Brief, the Reply Brief, and below.

OPINION

The examiner finds that Miyazaki '969 discloses a low emissivity film formed on a substrate which comprises a coating of oxide films alternately formed with silver (Ag) films, with the innermost layer being an oxide film and only the (111) diffraction line of Ag observed (Answer, page 3). The examiner further finds that Miyazaki '969 teaches an example where a ZnO film, a Ag film,

and a ZnO film are successively deposited on a glass substrate by a RF sputtering method (Answer, page 5).

The examiner finds that the differences between Miyazaki '969 and the claimed subject matter is that the reference is silent with regard to (1) sputtering a metal target in a reactive atmosphere of oxygen to form a metal oxide; (2) depositing a silver film with the (220) peaks higher than the (111) peaks; and (3) depositing a zinc oxide film with the (103) peaks higher than the other peaks (*id.*). To remedy these deficiencies, the examiner cites Miyazaki '864 which teaches a low emissivity coating structure with alternating layers of metal oxides and metal where the metal oxide is formed by reactive sputtering in 80% oxygen (*id.*). The examiner further finds that the "motivation for reactive sputtering [in Miyazaki '969]" is that it "allows for deposition of films with excellent durability" (*id.*, citing col. 1, ll. 42-45). From these findings, the examiner concludes that it would have been obvious to one of ordinary skill in the art to have modified Miyazaki '969 by reactive sputtering the zinc oxide layer as taught by Miyazaki '864 "because it allows for deposition of films with excellent durability." Answer, page 5.

It is well settled that the initial burden rests with the examiner to establish a *prima facie* case of obviousness. See *In re*

Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). It is also well established that before a conclusion of obviousness may be made based on a combination of references, the examiner must show that there was a reason, suggestion or motivation to lead an inventor to combine those references as proposed. See *Pro-Mold and Tool Co. v. Great Lakes Plastics Inc.*, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1629 (Fed. Cir. 1996). The modification of the prior art is not obvious unless the prior art suggested the desirability of the modification. See *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

The examiner's finding of "motivation" is not convincing. We do not agree with the examiner that the prior art suggests the desirability of the proposed modification. Miyazaki '969, which is a continuation-in-part of Miyazaki '864, teaches that the film of this invention is "a low emissivity film which is excellent in durability, especially in moisture resistance." Col. 1, ll. 10-12. Therefore, the teaching in Miyazaki '864 cited by the examiner of "a Low-E [emissivity] film ... excellent in durability, especially in moisture resistance" (Answer, page 5, citing col. 1, ll. 42-45) does not provide any convincing advantages or motivation for modifying the sputtering process of Miyazaki '969 (see the Brief, page 6). Furthermore, the reactive sputtering taught by Miyazaki

'864 is directed to a *metal* target (see Example 1) while the sputtering in a non-reactive atmosphere in Miyazaki '969 is directed to a metal oxide target (see Example 1 and the Brief, page 9). The examiner has failed to convincingly establish why one of ordinary skill in this art would have used the reactive sputtering of Miyazaki '864 in the process of Miyazaki '969.

Additionally, as discussed above, the examiner has found two other differences between Miyazaki '969 and the claimed subject matter (Answer, page 5). It is the examiner's position that Miyazaki '864 teaches controlling the reactive atmosphere such that there is 80% oxygen (i.e., Ar:oxygen = 2:8) "which is equivalent to the gas composition given by the appellant [sic, appellants] in Figure 9 examples H and J and thus the film deposited would have the required planes." Answer, page 7. We have discussed above that the examiner has failed to convincingly show any reason or motivation to use the reactive sputtering of Miyazaki '864 in the process of Miyazaki '969. Furthermore, the examiner has failed to point to any disclosure or teaching in Miyazaki '969 or '864 regarding the different levels of resistivity possible for the metal film (claim 42), the different peaks of the (220) planes for the silver film (claim 43), or the peaks for the (103) zinc oxide planes (claim 47). The examiner has only cited disclosures from

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Miyazaki '969 or '864 relating to (111) planes of the Ag film and (002) planes of the zinc oxide film (Answer, pages 3, 4, 7 and 8), even when the reactive sputtering is done in an oxygen and argon atmosphere (see Miyazaki '864, col. 2, ll. 43-51, and Example 1, esp. col. 8, l. 41). Therefore, even assuming *arguendo* that Miyazaki '969 and '864 were properly combined, the examiner has not established that the planes formed by the Ag and ZnO films of Miyazaki '864 would *necessarily* have been the same as those required by the claimed subject matter. See *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981).

Finley was applied by the examiner to show the well known use of primer layers and protective layers in this art (Answer, page 6). Therefore it is clear that Finley does not remedy the deficiencies of Miyazaki '969 and '864 discussed above.

For the foregoing reasons and those stated in the Brief and Reply Brief, we determine that the examiner has failed to establish a *prima facie* case of obviousness in view of the reference evidence. Accordingly, the rejection of claims 42-47 under 35 U.S.C. § 103(a) over Miyazaki '969 in view of Miyazaki '864 is reversed, as is the rejection of claims 48-51 under 35 U.S.C. § 103(a) over the references applied against claims 42-47 further in view of Finley.

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The decision of the examiner is reversed.

REVERSED

CHARLES F. WARREN)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
THOMAS A. WALTZ)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
CATHERINE TIMM)	
Administrative Patent Judge)	

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APPENDIX

42. A method of depositing a coating having an infrared reflecting film comprising the steps of:

providing a cathode defined as a first cathode which when sputtered in a non-reactive atmosphere deposits an infrared reflecting film having the possibility of two levels of resistivity, one level of resistivity higher than the other level of resistivity, the resistivity having a higher level provides an emissivity higher than the emissivity provided by the lower level of resistivity;

sputtering a metal cathode defined as a second cathode in an atmosphere having sufficient reactive gas to deposit a metal oxide film over a surface of a substrate, the metal oxide film having preferential crystal growth orientation to provide the infrared reflecting film having the lower level of resistivity, and

sputtering the first cathode in a non-reactive atmosphere to deposit an infrared reflecting metal film on the metal oxide film wherein the reflecting metal film deposited on the metal oxide film has the lower level of resistivity to provide a low emissivity coated article.